

Invoice**Moffatt & Nichol****3780 Kilroy Airport Way, Suite 750****Long Beach, CA 90806
Phone: 562-590-6500**

November 25, 2014

Project No: 6664-02

Invoice No: 000000707404

Robert Law

K&L Representing the Cooperating Parties
Group
186 Center Street, Suite 290

Clinton, NJ 08809

Project 6664-02 Lower Passaic River/Newark Bay Modeling

Professional Services from September 28, 2014 to October 25, 2014**LPR/NB Modeling Program TOM 8****Task 01 Coordination and Meetings****Professional Personnel**

	Hours	Rate	Amount
Senior Engineer/Scientist			
Canizares, Rafael	48.00	195.00	9,360.00
Engineer/Scientist II			
Mathew, Rooni	20.50	172.00	3,526.00
Totals	68.50		12,886.00
Total Labor			12,886.00
Total this Task			\$12,886.00

Task 02 Data Analysis and Monitoring**Professional Personnel**

	Hours	Rate	Amount
Senior Engineer/Scientist			
Canizares, Rafael	2.00	195.00	390.00
Engineer/Scientist II			
Mathew, Rooni	2.50	172.00	430.00
Staff Engineer/Scientist			
Manian, Dinesh	32.00	119.00	3,808.00
Totals	36.50		4,628.00
Total Labor			4,628.00
Total this Task			\$4,628.00

Task 04 LPR/NB Hydrodynamic Model**Professional Personnel**

	Hours	Rate	Amount
Staff Engineer/Scientist			
Manian, Dinesh	64.00	119.00	7,616.00
Totals	64.00		7,616.00
Total Labor			7,616.00
Total this Task			\$7,616.00

Task 05 LPR/NB Sediment Transport Model**Professional Personnel**

	Hours	Rate	Amount
Senior Engineer/Scientist			
Canizares, Rafael	2.00	195.00	390.00

Engineer/Scientist II				
Mathew, Rooni	2.00	172.00	344.00	
Totals	4.00		734.00	
Total Labor				734.00
			Total this Task	\$734.00

Task	07	LPR/NB Contaminant Fate & Transport Mdel		
Professional Personnel				
		Hours	Rate	Amount
Senior Engineer/Scientist				
Canizares, Rafael		6.00	195.00	1,170.00
Engineer/Scientist II				
Mathew, Rooni		89.00	172.00	15,308.00
Staff Engineer/Scientist				
Manian, Dinesh		53.00	119.00	6,307.00
Totals		148.00		22,785.00
Total Labor				22,785.00
			Total this Task	\$22,785.00
			Total this Phase	\$48,649.00

Reimbursable Expenses

Postage & Delivery				
10/3/2014	Federal Express Corp	INV 278733441 TID	14.03	
10/10/2014	Federal Express Corp	INV 279475544 TID	13.77	
	Total Reimbursables		27.80	27.80
		Total Reimbursable Expenses		\$27.80
		Total this Invoice		\$48,676.80

ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
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Billing Backup

Tuesday, November 25, 2014

7:14:10 AM

Moffatt & Nichol

Invoice 000000707404 Dated 11/25/2014

Project	6664-02	Lower Passaic River/Newark Bay Modeling			
LPR/NB Modeling	Program	TOM 8			
Task	01	Coordination and Meetings			
Professional Personnel					
			Hours	Rate	Amount
Senior Engineer/Scientist					
1548	Canizares, Rafael	9/29/2014	8.00	195.00	1,560.00
1548	Canizares, Rafael	10/3/2014	8.00	195.00	1,560.00
1548	Canizares, Rafael	10/6/2014	2.00	195.00	390.00
1548	Canizares, Rafael	10/7/2014	2.00	195.00	390.00
1548	Canizares, Rafael	10/8/2014	8.00	195.00	1,560.00
1548	Canizares, Rafael	10/13/2014	4.00	195.00	780.00
1548	Canizares, Rafael	10/15/2014	4.00	195.00	780.00
1548	Canizares, Rafael	10/16/2014	4.00	195.00	780.00
1548	Canizares, Rafael	10/17/2014	4.00	195.00	780.00
1548	Canizares, Rafael	10/21/2014	4.00	195.00	780.00
Engineer/Scientist II					
2219	Mathew, Rooni	10/6/2014	6.00	172.00	1,032.00
2219	Mathew, Rooni	10/7/2014	6.50	172.00	1,118.00
2219	Mathew, Rooni	10/8/2014	8.00	172.00	1,376.00
Totals			68.50		12,886.00
Total Labor					12,886.00
Total this Task					\$12,886.00
Task	02	Data Analysis and Monitoring			
Professional Personnel					
			Hours	Rate	Amount
Senior Engineer/Scientist					
1548	Canizares, Rafael	10/23/2014	2.00	195.00	390.00
Engineer/Scientist II					
2219	Mathew, Rooni	10/20/2014	2.50	172.00	430.00
Staff Engineer/Scientist					
2301	Manian, Dinesh	10/14/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/15/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/16/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/17/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/20/2014	8.00	119.00	952.00
2301	Manian, Dinesh	10/21/2014	8.00	119.00	952.00
Totals			36.50		4,628.00
Total Labor					4,628.00
Total this Task					\$4,628.00
Task	04	LPR/NB Hydrodynamic Model			
Professional Personnel					
			Hours	Rate	Amount
Staff Engineer/Scientist					
2301	Manian, Dinesh	9/29/2014	4.00	119.00	476.00
2301	Manian, Dinesh	9/30/2014	8.00	119.00	952.00

2301	Manian, Dinesh	10/3/2014	8.00	119.00	952.00
2301	Manian, Dinesh	10/7/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/8/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/9/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/10/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/13/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/14/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/15/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/16/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/17/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/22/2014	8.00	119.00	952.00
Totals			64.00		7,616.00
Total Labor					7,616.00
Total this Task					\$7,616.00

Task		05	LPR/NB Sediment Transport Model		
Professional Personnel					
			Hours	Rate	Amount
Senior Engineer/Scientist					
1548	Canizares, Rafael	10/23/2014	1.00	195.00	195.00
1548	Canizares, Rafael	10/24/2014	1.00	195.00	195.00
Engineer/Scientist II					
2219	Mathew, Rooni	10/20/2014	2.00	172.00	344.00
Totals			4.00		734.00
Total Labor					734.00
				Total this Task	\$734.00

Task	07	LPR/NB Contaminant Fate & Transport Mdel			
Professional Personnel					
			Hours	Rate	Amount
Senior Engineer/Scientist					
1548	Canizares, Rafael	10/6/2014	2.00	195.00	390.00
1548	Canizares, Rafael	10/7/2014	2.00	195.00	390.00
1548	Canizares, Rafael	10/23/2014	1.00	195.00	195.00
1548	Canizares, Rafael	10/24/2014	1.00	195.00	195.00
Engineer/Scientist II					
2219	Mathew, Rooni	9/29/2014	8.00	172.00	1,376.00
2219	Mathew, Rooni	9/30/2014	8.00	172.00	1,376.00
2219	Mathew, Rooni	10/1/2014	8.00	172.00	1,376.00
2219	Mathew, Rooni	10/2/2014	8.00	172.00	1,376.00
2219	Mathew, Rooni	10/3/2014	8.00	172.00	1,376.00
2219	Mathew, Rooni	10/6/2014	2.00	172.00	344.00
2219	Mathew, Rooni	10/7/2014	1.50	172.00	258.00
2219	Mathew, Rooni	10/13/2014	5.00	172.00	860.00
2219	Mathew, Rooni	10/14/2014	4.00	172.00	688.00
2219	Mathew, Rooni	10/15/2014	6.00	172.00	1,032.00
2219	Mathew, Rooni	10/15/2014	1.00	172.00	172.00
2219	Mathew, Rooni	10/16/2014	1.50	172.00	258.00
2219	Mathew, Rooni	10/16/2014	6.50	172.00	1,118.00
2219	Mathew, Rooni	10/20/2014	3.50	172.00	602.00
2219	Mathew, Rooni	10/21/2014	3.50	172.00	602.00
2219	Mathew, Rooni	10/22/2014	1.50	172.00	258.00
2219	Mathew, Rooni	10/22/2014	4.00	172.00	688.00
2219	Mathew, Rooni	10/23/2014	2.00	172.00	344.00
2219	Mathew, Rooni	10/24/2014	7.00	172.00	1,204.00
Staff Engineer/Scientist					
2301	Manian, Dinesh	9/29/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/1/2014	8.00	119.00	952.00

2301	Manian, Dinesh	10/2/2014	8.00	119.00	952.00
2301	Manian, Dinesh	10/6/2014	8.00	119.00	952.00
2301	Manian, Dinesh	10/7/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/8/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/9/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/10/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/13/2014	4.00	119.00	476.00
2301	Manian, Dinesh	10/23/2014	2.00	119.00	238.00
2301	Manian, Dinesh	10/24/2014	3.00	119.00	357.00
Totals			148.00		22,785.00
Total Labor					22,785.00
Total this Task					\$22,785.00
Total this Phase					\$48,649.00

Reimbursable Expenses

Postage & Delivery					
AP	000000208329	10/3/2014	Federal Express Corp / INV 278733441 TID		14.03
AP	000000208428	10/10/2014	Federal Express Corp / INV 279475544 TID		13.77
Total Reimbursables					27.80
Total Reimbursable Expenses					\$27.80
Total this Project					\$48,676.80
Total this Report					\$48,676.80



104 West 40th Street
14th floor
New York, NY 10018

(212) 768-7454
Fax (212) 768-7936

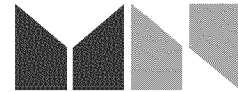
Detailed Description of work done by M&N personnel associated to the LPR/NB Modeling Program Task Order Memoranda 8 - Scope of Work for the period 09/28/2014 to 10/25/2014 M&N Project No. 6664

Hydrodynamics Principal Investigator - Rafael Cañizares.

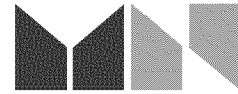
Task 1 – Project Management	<ul style="list-style-type: none"> • Internal coordination with Deltares and M&N • Calls and Coordination with Project Coordinator • Coordination with Project Coordinator and AQEA including calls for modeling update • Complete invoice for August-September period TOM8 • Internal discussion on simulations to be carried. • Internal work with AQEA to prepare presentation for TC meeting and discuss recontamination issues in the model • Prepare material for TC meeting • Attend TC meeting • Prepare SOW for Newark Bay. Call to discuss SOW. Internal review of existing authorization work including accounting work. • Review of status of reports and set up tasks to work to complete TOM8 • Complete NB SOW
Task 2 – Data Analysis	<ul style="list-style-type: none"> • Review HD model bathymetry update report
Task 5 – LPR/NB Sediment Transport Modeling	<ul style="list-style-type: none"> • Internal Review ST model latest run for final projections.
Task 7 – LPR/NB Contaminate Fate and Transport Modeling	<ul style="list-style-type: none"> • Discuss with Dinesh Manian requests from AQEA • Discussion with AQE about latest results • Internal Review of tests and discussion of results and model performance.

Rooni Mathew.

Task 1 – Project Management	<ul style="list-style-type: none"> • Conf call with AQEA for TC meeting prep, develop presentation for TC meeting • Attend TC meeting • Review NB SOW
Task 2 – Data Analysis	<ul style="list-style-type: none"> • Review report – settling velocity and reanalysis



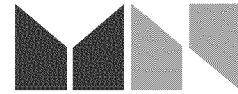
Task 5 – LPR/NB Sediment Transport Modeling	<ul style="list-style-type: none"> • Review results from ST MNR run w reset bed props every 15 years, • Review results from ST calibration run with revised DBEXC, • Review bathy report figs/text, • Review Spring PWCM ABS-SSC calibration • Develop run for MNR with bathy update
Task 7 – LPR/NB Contaminate Fate and Transport Modeling	<ul style="list-style-type: none"> • Start Tetra PCB Alt 3a CFT runs with V6 calibration and MNR HD/ST, MNR AOC and TCDD Alt 3a w V5 MNR HD/ST, process & review runs with 2mm fluff layer • Respond to AQEA questions on fluxes on July MNR run, process Alt 2 TCDD and tetra PCB runs, restart FS runs • Conference call with AQEA on recontamination analysis, follow-up, develop scripts and post-process MNR fluxes outputs for AQEA, review and transmit solids fluxes from V5/V6 calib/MNR runs to AQEA, develop and transmit sed rate from V6 calib and projection runs to AQEA • Conf call with H.Winterwerp to discuss hyporheic flow and bioturbation, review potential for post-Irene bed mobilization due to bioturbation/hyporheic flow, post-process CFT runs for AQEA, review AQEA sed. rate comparisons • Conference call with AQEA on recontamination analysis, follow-up on AQEA questions on deposition composition, launch runs w sens to bioturbation, review V1 to V6 model performance change and causes • Review post-processing for AQEA • Review CFT Alt3a w V5 MNR HD/ST run • Restart FS runs, process CFT runs for AQEA, review land building artifact w recycled calibn run • Devel scripts for runs with shared linkage input files, review FS ST model performance • Develop scripts for runs with shared linkage input files and launch 16 CFT runs for AQEA, restart crashed FS runs, review projn mass balances, review projn run with reset bed properties, review calibraton run with revised DBEXC, launch calibration AOC with AQEA bed foc • Review/devel NB hydro/sedtran modeling SOW • Conference call with dmi to discuss NB modeling SOW, revise NB SOW • Debug/restart CFT FS runs with V6 Calib ST, review setup for dearmored run, setup for revised V6 calib run • Process 16 CFT runs & review outputs for AQEA • Process outputs from 16 test runs for AQEA • Revise NB SOW • Review CFT results w AQEA, respond to AQEA questions, launch AOC and CFT runs with dearmored bed HD/ST • Process outputs for AQEA, respond to AQEA questions



	<ul style="list-style-type: none"> • Debug MNR AOC/CFT run with dearmored bed (MNR), set up 20 projection runs and 1 AOC run, transmit AOC MNR file to AQEA
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Dinesh Manian

Task 2 – Data Analysis	<ul style="list-style-type: none"> • Navigation scour update • Prepare figures for Bathymetry report based on bathymetric data • ST report- settling velocity reanalysis
Task 4 – LPR/NB Hydrodynamic Modeling	<ul style="list-style-type: none"> • Processing mass-balance in sensitivity runs • Tabulate and plot time-series of bathymetry change in all model cells in the river to understand long-term model behavior (esp. armoring cells); Cumulative volume/mass change in individual cells • Comparing change in bathymetry between ST V6 and V5 and data for different periods with MB survey; Improvements with V6 model • Setting up final calibration ST run with correct consolidation parameters and mass content in propeller scour release • Debugging calibration ST run with correct consolidation parameters and mass content in propeller scour release • Processing revised calibration run with corrected consolidation parameters, and sensitivity projection run with recycled bed properties • Processing revised calibration run with corrected consolidation parameters, and sensitivity projection run with recycled bed properties • Bathymetry report • Bathymetry report - figures • Bathymetry report- navigation scour analysis
Task 7 – LPR/NB Contaminate Fate and Transport Modeling	<ul style="list-style-type: none"> • Processing mass-balance in sensitivity runs • Examining profiles of bed composition/density in the top 15 cm in Tierra removal areas; Evolution of bed composition in time after remediation • Examining mixing of sediment across cap; Profiles of bed in capped cells to look for sediment penetration through cap • Processing ST runs for AQEA • Checking for sediment mixing through cap: Understanding build up of thick indiv. deposited layers • Checking for sediment mixing through cap: Understanding build up of thick indiv. deposited layers • TC follow-up: Setting up ST projection run with recycled bed properties from preceding cycles • Processing ST sensitivity runs for AQEA



	<ul style="list-style-type: none">• Processing final ST calibration, and ST sensitivity to bed-properties
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Billing Information

Tracking ID no. 771253879165
Invoice no. 2-794-75544
Account no. 1903-9632-0
Ship date 09/23/2014
Invoice date 09/26/2014
Due date 10/11/2014
Tracking ID Balance due \$0.00
Status Closed

Messages

Distance Based Pricing, Zone 2
The Earned Discount for this ship date has been ca[Read More..](#)
Fuel Surcharge - FedEx has applied a fuel surcharg[Read More..](#)

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Sender Information

Deborah Bashkoff
Moffatt & Nichol
104 West 40th Street
NEW YORK NY 10018
US

Recipient Information

Wen Ku
Anchor QEA, LLC
123 Tice Boulevard
WOODCLIFF LAKE NJ 07677
US

Shipment Details

Ship date 09/23/2014
Payment type Shipper
Service type FedEx Priority Overnight
Zone 02
Package type Customer Packaging
Weight 1.00 lbs
Pieces 1
Meter No. 5026004
Declared value \$0.00

Charges

Transportation Charge	24.30
Fuel Surcharge	1.14
Weekday Delivery	0.00
Discount	-10.94
Earned Discount	-0.73
Total charges	\$13.77

Original Reference

Customer reference no. 6664-02 K, xy
Department no.
Reference #2
Reference #3

Updated Reference [Edit](#)

Customer reference no.
Department no.
Reference #2
Reference #3

Proof of Delivery

Delivery date 09/24/2014 09:59
Service area code A2
Signed by N. GLASER

Cost Allocation Reference [Edit](#)

Cost allocation
Shipment Notes

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Billing Information

Tracking ID no.	771128477455
Invoice no.	2-787-33441
Account no.	1903-9632-0
Ship date	09/11/2014
Invoice date	09/19/2014
Due date	10/04/2014
Tracking ID Balance due	\$0.00
Status	Closed

Messages

FedEx has audited this shipment for correct packaging. [Read More...](#)
Distance Based Pricing, Zone 2
The Earned Discount for this ship date has been calculated. [Read More...](#)
Fuel Surcharge - FedEx has applied a fuel surcharge. [Read More...](#)
Minimum Billable Weight was applied.

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Sender Information

Deborah Bashkoff
Moffatt & Nichol
104 West 40th Street
NEW YORK NY 10018
US

Recipient Information

Wen Ku
Anchor QEA, LLC
123 TICE BLVD
WOODCLIFF LAKE NJ 07677
US

Shipment Details

Ship date	09/11/2014
Payment type	Shipper
Service type	FedEx Priority Overnight
Zone	02
Package type	FedEx Box
Actual weight	1.00 lbs
Rated weight	2.00 lbs
Pieces	1
Meter No.	5026004
Declared value	\$100.00

Charges

Transportation Charge	24.75
Declared Value Charge	0.00
Fuel Surcharge	1.16
Weekday Delivery	0.00
Discount	-11.14
Earned Discount	-0.74
Total charges	\$14.03

Original Reference

Customer reference no.	6664-02/XY
Department no.	
Reference #2	
Reference #3	

Updated Reference [Edit](#)

Customer reference no.	
Department no.	
Reference #2	
Reference #3	

Proof of Delivery

Delivery date	09/12/2014 10:02
Service area code	A2
Signed by	.GLAZIER

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Cost allocation	
Shipment Notes	

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